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from their state of mental lethargy, their marking in school rose to 74 per cent, and their demeanor proportionately improved. From November, 1886, to April, 1887, inclusive, the men being employed as laborers and at various industries, as brush-drawing, their average marking was as follows: demeanor,  $2\frac{1}{2}$ ; labor,  $2\frac{9}{11}$ ; school,  $2\frac{9}{30}$ , or 71 per cent, — a great improvement as compared with their record from December, 1885, to May, 1886, inclusive, as given above. The record of these eleven men for corresponding periods before and after their course of physical training presents a marked contrast.

If the improvement noted in these dullards during the time they were receiving their athletic training was the result of better spirits, arising from the novelty of their position, and pride that they were singled out from their fellows for certain work, and removed in a measure from prison monotony, it would be reasonable to expect that with the removal of the stimulus, and the return of all to the routine prison-life, with the consequent loss of the individuality they might have enjoyed, there would come sooner or later a falling-back and lapsing into their previous state of mental inertia. But, returned to the *régime* and discipline observed with other prisoners, they maintained their good record; and, six months after the termination of the experiment, the mental power revealed by their physical-culture course has continued to develop, and the former shuffling gait and stooping shoulders which characterized them as a class have been replaced by an alertness and promptitude of action.

I do not think the improved mental condition of these men can be attributed to other than the strengthening of the brain-centres by the cultivation and development of muscle and muscles under the control of these same nervous centres, the one participating and taking part in the improvement of the other. From the words of commendation I have received, and noting the progress of the men under conditions that once seemed to promise so little to them by reason of their stupidity and obtuseness, I regard my class in physical culture as more than an experiment, — a success, — as showing that something more than mere brawn can be accomplished by muscular exercise when properly selected, guided, and governed.

H. D. WEY, M.D.

#### DISTILLERY-MILK REPORT.<sup>1</sup> — II.

IN response to the question, What is your opinion as to the wholesomeness of distillery swill as food for cows? the following were received:—

<sup>1</sup> Continued from p. 553.

[D. W. HAND, M.D.]

I do not believe it to be a wholesome food.

[L. MCLEAN, M.R.C.V.S.]

Detrimental to the general health of any ruminating animal. As such food does not require to be masticated, or remasticated, hence a perverted condition of the ruminating apparatus.

[EDWARD PLAYTER, M.D., editor of the Canadian *Health journal*.]

I have observed a number of items in medical journals (of which I, as editor for twelve years of the Canadian *Health journal*, have received many), referring to the injurious effects of the swill upon the milk of milch-cows fed with it, but I cannot call to mind any facts. Knowing well the effects of dirt upon the organs and secretions of both man and animals, I am convinced that distillery swill, which must constitute a very imperfect food, would furnish but a very inferior milk, and that cows fed chiefly or largely upon such swill give a milk of inferior quality, and not fit for habitual use, especially as food for infants. Animal chemistry and physiology would seem to render this impossible.

[CHARLES SCHAEFFER, M.D., Philadelphia, Penn.]

Upon general principles, I judge that food which breaks down the cow's constitution, very much as chronic alcoholism (which does not result in fatty degeneration) destroys the human constitution, producing diarrhoea and muscular atrophy, is not likely to give a very healthy secretion of milk, but, on the contrary, a poisonous one.

[OSCAR C. DEWOLF, M.D., Chicago, Ill.]

I have been commissioner of health of the city of Chicago for eleven years past, and during that period, until 1885, several hundred milch-cows were constantly fed in distillery sheds in this city. I believe that distillery slop before it has passed into the acetic acid fermentation, and fed in proper quantities to cows running at large, is perfectly wholesome food. I object to so-called 'distillery milk,' because of the close and long confinement of cows, and the dirty methods of gathering and storing the milk. It is probable, also, that cows thus confined do not often receive the quantity of hay they require for vigorous health. These conditions must affect the milk, whether chemists can detect the change or not. Not a cow giving milk for public supply is now fed and confined in a distillery shed in this city, and for reasons above given I shall oppose any attempt to do so.

[WILLIAM OLDWRIGHT, M.D.]

I consider distillery swill an unwholesome food for cows.

WILLIS G. TUCKER, M.D., professor of inorganic and analytical chemistry, Albany medical college.]

I am opposed to the use of such waste as a chief or exclusive diet for milch-cattle, though I do not believe that the feed is the sole cause of disease among cattle in swill-stables, or of the poor milk furnished by them.

[E. H. BARTLEY, M.D.]

Unwholesome both to cows, and to the children fed upon the milk.

[WILLIAM K. NEWTON, M.D.]

I am of the opinion that it is an unwholesome food, and that the milk produced by cows using it is not healthful.

There has been a great deal on this subject published, and all the German authorities agree that stall-fed cows give as good milk as those allowed to graze, due attention being paid to the sanitary condition. In many German cities the milk-supply is obtained from cattle thus cared for. In the last two reports of the Wisconsin experiment-station, very interesting accounts are given about soiling cows; and the results, as to yield and quality of the milk, are nearly the same as from cows allowed to feed in the pasture. In the soiling method the food is all given to the cows in the stalls, and they are only allowed in the barnyard for exercise, and on clear days. The cows are turned into milk-making machines.

In the case of distillery swill, the cattle are not only fed on an unnatural food, but are at the same time subjected to very unsanitary conditions; and both combined cause disease, and hence the product must, of necessity, be unhealthful. I am pretty certain that those scientific men who are willing to indorse this business are either not acquainted with the subject, or confound proper soiling with the methods in vogue at Blissville. The two systems are separate and distinct.

[J. BLAKE WHITE, M.D.]

Positively unwholesome.

[GEORGE H. ROHÉ, M.D.]

I have no hesitation in saying that distillery swill is not only unhurtful, but desirable as food for dairy cattle. I have seen no trustworthy evidence that the bad results of stall-feeding in dairies are due to this food. I would desire to express my opinion as emphatically as possible upon this point.

[PROF. WILLIAM H. BREWER.]

I have an *opinion*, founded on reading rather than observation, that milk from cows fed principally or largely on distillery swill is *decidedly unwholesome*, but that distillery swill may be used

in small quantities, along with other food, without seriously or demonstrably deteriorating the wholesomeness of milk; that the evil effect is largely a matter of relative quantity of swill to other food. Moreover, the surroundings of the cows in swill-milk stables as usually kept, and also the health of the cows as usually found in those stables, is, or are, factors causing much of the alleged unwholesomeness. Milk is an easy carrier of smells and disease.

[HENRY HARTSHORNE, M.D.]

My supposition is, that it is very likely to contain a remnant of alcohol, and that this must interfere with its suitableness for cattle-food. If this be so, it is also *possible* that a small portion of alcohol may pass through the cow's blood into the milk, to the injury of infants fed upon it. But such possibilities are only sufficient to justify careful *investigation*. At the best, however, such material is obviously very far removed from the condition of natural food for cows.

[E. M. NELSON, M.D.]

I think it is not a wholesome food, and that the milk from swill-fed cows is excessively acid, decomposes early, and predisposes to disturbances of digestion.

[W. SIMON, PH.D.]

My opinion, based on my examination in 1882 and numerous observations made in various localities since that time, is that 'swill,' when used in moderate quantities alongside of plenty of hay, grass, or other similar food, is a highly valuable article for feeding cattle. On the other side, swill becomes dangerous when fed in too large quantities, most likely on account of its high percentage of nitrogenous matter.

[CHARLES AMBROOK, M.D., Boulder, Col.]

If made an exclusive diet, unwholesome; if not exceeding one-quarter of whole diet, and good pasturage always at hand, nothing very detrimental in distillery food that I have seen.

[A. J. HOWE, M.D., Cincinnati, O.]

Distillery slop blackens the teeth of kine,—cows or oxen,—makes their breath offensive, gives them diarrhoea, and weakens the muscular system to a degree that, though fat, the creatures can hardly walk. The above I know from observation.

[NORMAN S. BRIDGE, M.D.]

That it is an unnatural food; almost sure, sooner or later, to cause some disease in the cows, unless it is freely mixed with a large quantity of other and more natural food. Doubtless the complaints referred to under No. 2 were mainly in

cases where the milk used was from cows the health of which had undergone some deterioration from the diet referred to.

[J. L. HAMILTON, M.D., Peoria, Ill.]

Since our dairies have been removed to the country, and the cows fed on other food, and some slop still used, the effect of the still-slop is not noticed. Of course, there are other things as well as the slop. When cows are kept up in barns, and fed only on still-slop, the air they breathe is very impure, and they will drink but little water and have no exercise. This contributes to the unhealthiness of dairy milk.

[C. A. ROHILLARD, M.D.]

Knowing that this matter is extensively used in some parts for fattening purposes, and that healthy beef is brought to the market as a result of this mode of feeding, I would incline to the belief that the milk from cows so fed is all right. I am not prepared, however, to state positively that it should be so under all circumstances.

[JAMES E. REEVES, M.D., Wheeling, W. Va., formerly secretary state board of health.]

My observation, from the stand-point of the general practitioner of medicine, fully warrants the belief that the milk of town-fed cows — feeding on slops, garbage, and brewery refuse — is dangerous to the public health.

[HENRY D. HOLTON, M.D., Brattleborough, Vt.]

Here in Vermont we do not have any thing of the kind; yet we are well aware that the food of the cow has much to do with the quality of the milk and butter. In summer, dairymen know from experience and observation that there is a great difference in the pastures. When cows are in some pastures, the milk, and especially the butter, is much better than when in others. Many people can tell butter made when the cows are fed on cottonseed-meal instead of corn-meal. It is also true that the milk of cows who are worried or frightened will sour much quicker than when not so worried. Infants fed with the milk of cows worried or heated by running (as is sometimes done by boys in bringing them from the pasture) will suffer from colic, and often from diarrhoea. There is no doubt in my mind that swill from distilleries would produce a very poor quality of milk.

[D. L. PHARES, M.D., member of state board of health, Agricultural college P.O., Miss.]

That it is unwholesome. In small quantity, combined with plenty of good, sound normal cow-food, it may do no serious injury; but in any considerable quantity it is, in my opinion, unwholesome. The nature and condition of the substance

seem to me to justify this opinion. True, it may for a time seem to improve the condition of the cow, but even then the physiologist and pathologist can detect evidences of damage.

[G. A. LIEBIG, Baltimore, Md.]

I would unhesitatingly prefer other than milk from cows so fed, not only for the reason of character of food, but also for the manner of treatment of the animals, — housing, etc.

[R. HARVEY REED, secretary Ohio state board of health.]

I think distillery swill is very objectionable food.

[L. M. KENYON, M.D. Buffalo, N.Y.]

I think, from what I have read from time to time, and know from what little I have seen, that it is most decidedly detrimental, although I can now give no detail, or specially individual cases.

[J. F. KENNEDY, M.D., secretary Iowa state board of health, Des Moines, Io.]

Upon general principles, I should consider such food as injurious to the cows, and hence productive of milk injurious to those using it, especially to children largely dependent upon it.

[F. N. BOKER, sanitary engineer, Montreal, Can.]

Decidedly unwholesome. It soon acquires a rotten flavor, and is deceptive as to nourishment. During our long Canadian winter in Montreal, a good deal of swill is given to milch-cows to increase the flow of milk; and, as the mortality among young children is very great in this city, I attribute it to the poor quality of the milk, etc.

[*To be continued.*]

#### EXPLORATION AND TRAVEL.

*Lieutenant Wissmann's expedition.*

In *Science* of April 22 we referred to Lieutenant Wissmann's trip from Luluaburg to the Lubilash. A letter from Wissmann which was published in the *Verhandlungen der Gesellschaft für Erdkunde*, April, 1887, contains the following interesting details. He ascended the Lulua as far as Katende (the situation of which may be seen on our map of Central Africa). Here he visited the grand Lulumba Falls, which are the termination of the navigable part of the Lulua. He had some difficulty in crossing the river, on account of the hostility of the natives. He proceeded eastward, and, after crossing the river Moio on a bridge, reached Tenda-Mota. Here is the boundary between the Bashilange and Bagna-Kalosh, who belong to the Baluba. The Kalosh and their eastern neighbors live in small villages of from four to ten houses, which are surrounded by fields in which they